

Project S'COOL

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INTRODUCTION

The Students' Clouds Observations On-Line or S'COOL project was piloted in 1997. It was created with the idea of using students to serve as one component of the validation for the Clouds and the Earth's Radiant Energy System (CERES) instrument which was launched with the Tropical Rainfall Measuring Mission (TRMM) in November, 1997. As part of NASA's Earth Science Enterprise CERES is interested in the role clouds play in regulating our climate. Over thirty schools became involved in the initial thrust of the project.

The CERES instrument detects the location of clouds and identifies their physical properties. S'COOL students coordinate their ground truth observations with the exact overpass of the satellite at their location. Their findings regarding cloud type, height, fraction and opacity as well as surface conditions are then reported to the NASA Langley Distributed Active Archive Center (DAAC). The data is then accessible to both the CERES team for validation and to schools for educational application via the Internet.

By March of 1998 ninety -three schools, in nine countries had enrolled in the S'COOL project. Joining the United States participants were from schools in Australia, Canada, France, Germany, Norway, Spain, Sweden, and Switzerland. The project is gradually becoming the global project envisioned by the project's creators. As students obtain the requested data useful for the scientists, it was hoped that students with guidance from their instructors would have opportunity and motivation to learn more about clouds and atmospheric science as well.

IMPLEMENTATION

Students' observations and comments are reported by e-mail, Internet, fax or mail. The S'COOL website is designed to process e-mail and Internet reports automatically and thus enable large numbers to participate. Where computers are readily available in the classrooms the students are entering the data themselves. The majority are reporting in this manner. In others teachers are sending in their class' reports by whatever means is available to them. Positive experiences are reported by the teachers. One in Big Timber Grade School, Big Timber, MT, reported "The kids learned and it was fun....the kids did most of it. They felt important." Quite a few local newspapers have noted the enthusiasm of students involved in the S'COOL project.

Throughout both the pilot phase and the early stages of the project NASA personnel involved with CERES or S'COOL have taken advantage of their travels to various locations to visit a number of the participating schools. They have been received enthusiastically, and frequently have been a much welcomed resource. A real effort has been made to keep the students and the scientists connected. A "Wall of Fame" has been created in the NASA Langley Atmospheric Science Division. There a map pinpoints the location of participants and features newspaper articles that schools have shared with the project manager.

Feedback from the classroom teacher has played a vital role in helping to create and improve a useful project. Comments have ranged from identifying typos to suggestions for "new improved" ways of reporting. Many of their

suggestions have been incorporated into a constantly evolving website.

Having recently retired from teaching Earth Science at the High School level the first author has been asked to come on board NASA's S'COOL Project. Part of her job is to help with the logistics of the project and present the project at various meetings. Developing appropriate materials for various age levels is also part of her assignment.

A number of aids were created to enable the students to be as accurate as possible. A S'COOL poster featuring cloud pictures, descriptions and background information has just undergone its final revision. The website has been constantly revised to include related articles, helpful materials and related lesson plans. Regarding the latter, lesson plans have recently been added to enable the students to select desired reported data from the website and run a statistical analysis. This has been prepared so that it can be applied on several different levels.

TEACHER IMPRESSIONS

Meeting the criteria for the Standards of Learning (SOL) is critical. Teachers are hard pressed to fit everything from their curriculum into the classroom schedule. S'COOL fits in very naturally with the meteorology units found in a number of grade level curriculums. Creative teachers have found ways of carrying the project into other curricula as well, as students perform many math calculations, write their observations and impressions, check maps and use the latest technology to communicate their findings.

As anyone in education can tell you, students know when something is real or just "fluff." There has been no doubt in students' minds as to the importance of what they are doing. As one young student said, "We have to do this....NASA is depending on us." The value of students participating in real research is incalculable. Knowing that they are involved with something of real significance is at once a motivation, not just to get the job done, but to do it with care. An experience of this nature can help build self-esteem which carries much further than the current assignment. Then there is always the possibility that the student will see a future interest

which may be his vocation or at least an avid avocation.

FUTURE OUTLOOK

S'COOL is actively seeking participants on an even more global dimension. With the planned launch of EOS-AM in August, 1998, the S'COOL team would like to have more participants from the more northerly and southerly latitudes. We recently registered our first southern hemisphere participant in Australia.

Rewards have been developed in the form of a S'COOL Observer logo, which has been developed as a decal for each participant. Other incentives and rewards may be developed based on teacher suggestions as to what they feel would be most useful.

OPPORTUNITIES

The S'COOL project is now available to interested teachers. Registration information can be obtained by contacting NASA as indicated below.

PARTICIPATION

Once a class has registered they will need to determine the overpass times prior to observing. Links on the S'COOL website can help the class determine their latitude and longitude, which they will need in order to determine the correct time for observing. A form is provided on the website for obtaining the overpass times. If the class does not have Internet access they may contact S'COOL by e-mail, Fax, mail or phone. After receiving the overpass times they will select a time suitable to them to go outside and observe.

Explanations for observations are given on the website and on the poster that registered participants receive. Some simple weather instruments are useful in making the observations, but they are not necessary. Students report their findings to NASA via the Internet, e-mail, mail or fax. They will find templates available for their reports. Reported data then becomes accessible

via the Internet for study, comparison and analysis.

REFERENCES

- [1] Chambers, Lin H., D. F. Young, and A. M. Racel, "The CERES S'COOL Project: Development and Operational Phases", Proceedings of the Seventh Symposium on Education, American Meteorological Society, pp. 90-93, January, 1998.
- [2] Chambers, Lin H., Bruce R. Barkstrom, and Bruce A. Wielicki, "CERES and the S'COOL Project," in NASA Conference Publication 3355, "Sixth Alumni Conference of the International Space University. 10th Anniversary Summer Session Program 1997," Houston, TX, July 11, 1997.

- [3] <http://asd-www.larc.nasa.gov/SCOOL/>

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